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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,567	06/07/2001	William R. Dudley	55806USA1A.002	7795

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/876,567

Applicant(s)

DUDLEY ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31,33-51 and 57-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24,47-51 and 57-59 is/are allowed.
- 6) ☒ Claim(s) 25-31,33-46 and 60-70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-31, 33-51, 57-66, and newly added claims 67-70. The rejection under 35 USC 112 first paragraph has been withdrawn. Claims 1-24, 47-51 and 57-59 are allowed. Claims 25-31, 33-46, and 60-66 remain rejected and claims 67-70 are newly rejected for substantially the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 103

2. Claims 25-31, 33-46, and 60-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson (U.S. Patent 6,488,721) in view of Liu et al (U.S. Patent 6,159,544).

Carlson teaches a battery component (38, 39) comprising an anode (710), a separator (102), a cathode (201), an edge material (301) contacting an edge of the cathode, and a cathode current collector (401) (see Fig. 10, col. 32, line 15 et seq.). A substrate (2) is coated with a separator material (102), followed by an edge material (301) and a cathode material (201), thereby "improving" the thickness profile of the cathode (see Fig. 6). The edge material acts as a physical boundary. The substrate may also be coated with a cathode material (201) and then the edge material (301) such that the cathode material and edge material touch each other (see Fig. 5). The edge material is capable of functioning as a barrier to moisture and light. The cathode and edge layers may be solvent coated (see col. 27, line 10). The cathode material edge is

approximately square and has a uniform thickness profile and a width of less than 200 microns (see col. 18, line 2; Fig. 5). The cathode and edge layers may be extrusion coated (see col. 27, line 15). The cathode material layer may be calendered (see col. 17, line 57). The edge material may comprise an electrically insulating thermoplastic polymer such as an ethylene, propylene, or urethane (see col. 25, line 10). The wet and dry coating thicknesses of the edge material are approximately equal to the wet and dry coating thickness of the cathode material (see Fig. 5; col. 25, line 1). Regarding claims 67-70, the cathode material comprises an electrode active material, an electrically conductive material, and an ionically conductive material (e.g., ionically conducting polymer, electrolyte salt) (see col. 17, line 60; col. 29, line 43 et seq.). The cathode material and the edge material are "immiscible" because distinct layers are formed upon coating. The shape of the cathode edge is inherently altered by the presence of the edge material. The cathode thickness is in the range of 5 to 200 microns (e.g., 100 microns), which anticipates the ranges of bulk and edge cathode thicknesses. The substrate (2) may comprise paper, a metal foil, or a silicone release liner (see col. 16, line 61 et seq.). The separator layer in contact with the cathode may comprise a solid polymer electrolyte (see col. 29, line 43). Further, regarding claim 25, the edge material may be non-viscoelastic (see col. 27, line 17). Regarding claim 44, Carlson teaches a slitting step in column 26, line 16.

However, Carlson does not teach that the cathode and edge layers are coated substantially simultaneously by a die coater having at least two slots, as recited in claims 25, 29, 36, and 39.

Liu et al. is directed to a die coater having multiple substantially parallel slots for coating adjacent layers of different material on a substrate (see abstract; Fig. 1). Shims are arranged in the slots to form the stripes (see col. 4, lines 40-46).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the die coater of Liu et al. to form the cathode and edge layers of Carlson. In column 2, line 32, Liu et al. teach that the disadvantages of the prior art include “non-uniform width of stripes” and “ambiguous interfaces of coating solutions.” Further, in column 2, line 43, the reference teaches that an object of the invention is to provide “distinct interfaces” between stripes. Accordingly, this would provide the artisan sufficient motivation to use the die coater of Liu et al. to form the cathode assembly of Carlson.

Regarding the ranges of separation distance and substrate speed recited in claims 30 and 31, these ranges are not considered to distinguish over the references. A small (e.g., <5 mm) separation between slots would be necessary to obtain the touching stripes disclosed by Liu et al. Additionally, the substrate speed may be adjusted by a skilled artisan depending on the viscosity of the coating mixtures and desired thickness of the coatings.

Regarding claims 41-43, the die of Liu et al. may be considered to be a “dual slot extrusion die,” a “slot fed knife die,” and a “fluid bearing die.” The definition of each type is provided in column 7 of U.S. Patent 6,051,297 (Maier et al). The main differences are in the viscosity of the material being coated and the arrangement of the ancillary rollers, but neither of

these features affect the basic structure of the die. Thus, the die of Liu could be used to perform any of these coating processes.

Response to Arguments

3. Applicant's arguments filed April 8, 2005 have been fully considered but they are not persuasive. Applicants maintain their traversal of the rejection over the Carlson and Liu references. However, the rejection is still believed to be proper for the reasons previously set forth on the record. Specifically, the Liu reference is believed to be relevant to *any* coating process involving adjacent stripe coating of different materials. Applicants assert that the Liu reference is "limited in its details" to coating the low-solids materials of its examples. However, as previously stated, the reference is not limited to such exemplary embodiments (MPEP 2123). It is believed that it would be well within the skill of the art to apply the Liu process and apparatus to other coating processes in an effort to try to improve the coated product. The fact that the Liu reference does not relate to electrochemical cells is also not believed to negate the analogy of Liu reference to Carlson since the problems addressed by Liu would be present in coating processes such as that of Carlson. Further, the Liu reference provides specific guidance as to how to adjust the parameters of the coating materials relative to each other to achieve a successful result. See col. 3, line 60 for example:

Preferably, in the method of the present invention said liquid A and said liquid B have viscosities which are in a ratio of A:B=1:2.55 to 2.55:1, and more preferably, A:B=1:1.6 to 1.6:1.

Preferably, in the method of the present invention said liquid A and said liquid B are fed at flow rates which are in a ratio of A:B=1:2.55 to 2.55:1, and more preferably, A:B=1:1.6 to 1.6:1.

Further, the Carlson reference is not limited in its disclosure of coating methods. See col. 27, line 10 et seq. In particular the Carlson reference teaches the following:

The liquid coating mixture may have any desired solids content that is consistent with the viscosity and rheology that is acceptable in the coating application method. After the

As such, it is maintained that an artisan would have motivation to make the proposed combination and a reasonable expectation of success. Further, the disclosures of both references would enable the artisan to carry out the proposed modification. As such, the rejection is still believed to be proper.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1746
June 20, 2005